

THE 2005 INTERNATIONAL SURVEY OF TRUMPETER SWANS IN ALBERTA, SASKATCHEWAN, MANITOBA, AND THE NORTHWEST TERRITORIES.

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ABSTRACT

The survey of Trumpeter Swan (*Cygnus buccinator*) breeding and summering habitat in Alberta, Saskatchewan, Manitoba and the Northwest Territories was completed in August and September 2005. Aerial survey flights totaled over 136 hours across the region. This is the first survey where swans were recorded in Manitoba with a total of 35 birds including 25 adults and 10 cygnets. Total swan numbers increased in all areas surveyed in 2005 from the counts in 2000: Alberta 1,724 birds (73.3% increase); Saskatchewan 78 birds (59.2% increase); and the Northwest Territories 415 birds (41.2% increase). The greatest increase in adult numbers occurred in Alberta 1,175 birds (+75.9%), followed by Saskatchewan 53 birds (+65.6%) and the Northwest Territories 327 birds (+60.3%). Cygnets accounted for 31.8%, 32.1% and 21.2% of the swans counted in Alberta, Saskatchewan, and the Northwest Territories, respectively. Cygnet numbers were higher than in the 2000 census in all areas except the Northwest Territories while mean brood size was lower except in Alberta which increased slightly. Trumpeter Swan numbers continue to increase across their current range with higher densities in some regions and expansion into new areas of suitable habitat in others. The Trumpeter Swans surveyed in this region are part of the Rocky Mountain and Interior Populations and currently rely on limited wintering ranges in the Greater Yellowstone and Lacreek National Wildlife Refuge areas, respectively. Restriction on expansion of the wintering areas will more likely limit population growth than will the availability of summer habitat for Trumpeter Swans in this region.

INTRODUCTION

Surveys of Trumpeter Swans are conducted across their entire breeding range once every 5 years (Caithamer 1996, Caithamer 2001). This report summarizes the results of surveys conducted across the known range of the species in Alberta, Saskatchewan, Manitoba, and the Deh Cho Region, Northwest Territories, Canada as well as in areas where they may be expanding. In Manitoba, Trumpeter Swans were reported on Pinawa Channel near Whiteshell Provincial Park in Spring 1998 (Burgess and Bote 1999). Although swans were not observed in Manitoba during the 2000 survey, recent observations (Arquilla *et al.* 2002, Patton *et al.* 2004) resulted in extensive surveys in the Duck Mountains, Porcupine Hills, Riding Mountain National Park, and Whiteshell Provincial Park of the province. In Alberta, the Cold Lake Air Weapons Range was surveyed for the first time. Existing survey areas were also expanded in some regions to cover

incidental sightings outside the standard survey region.

METHODS

The majority of surveys were conducted by intensive searching from aircraft. Most surveys employed fixed-wing aircraft with an observer on either side of the aircraft, flying at elevations of 150 – 200 m above ground level and speeds of approximately 150 km/h; two regions used a helicopter (Pincher Creek - Waterton, Alberta and High Level, Alberta). Elk Island National Park surveys were also conducted as regular ground checks during the summer. Incidental observations were provided by landowners and other non-survey individuals. We consider the survey results to be total minimum counts in each area.

Surveys were focused on established or traditional breeding areas of Trumpeter Swans. All water bodies known to have been occupied by swans in previous surveys were checked. In some regions other suitable

water bodies in areas adjacent to traditional lakes were surveyed. We included additional wetlands or regions in our survey based on incidental reports of swan observations made since the last continental survey in 2000. The number of birds in each survey area was tallied by adult (> 1 year) and young-of-year (cygnet) age categories.

Locations of Trumpeter Swans were recorded with GPS units and marked on 1:250000 topographic paper maps. Flight track logs were recorded on GPS units or on laptops using Moving Map Software (e.g. Fugawi). Swan locations were compared to previously documented sites and this year's numbers were added to corresponding site histories. New site locations and swan numbers were added to existing swan databases.

Surveys were conducted between 24 August and 14 September 2005 with incidental observations on 9 August, 24 September, and 3 October. Personnel from the three provincial government wildlife agencies, the Canadian Wildlife Service, Parks Canada Agency, and Ducks Unlimited Canada conducted all surveys.

RESULTS

Aerial survey flights (Table 1) totaled 93 hours in Alberta (eight crews), 9 hours in Saskatchewan (one crew), 13.5 hours in Manitoba (three crews), and 21 hours in the Northwest Territories (two crews).

A total of 2,259 Trumpeter Swans was counted in Alberta, Saskatchewan, Manitoba and the Northwest Territories which included 1,578 adults and 681 cygnets (Table 2, Figure 1). Total recorded population for each jurisdiction was Alberta 1,731, Northwest Territories 415, Saskatchewan 78, and Manitoba 35. Demographic summaries are provided in Table 2, and the distribution of adult swans in pairs, flocks or as singles is provided in Table 3.

The number of swans observed in all jurisdictions except Lac La Biche and Pincher Creek/Waterton was higher than in any previous survey. Survey coverage for some geographic sub-regions was expanded in response to the expansion of areas used by the swans and is discussed in the text below. In areas where the survey coverage was similar to that of 2000, and to the 1995 survey for several regions, comparisons of the results are made to show the increase (Table 4).

Alberta

Grande Prairie - Valleyview

Higher numbers of adults and young were found this year, with a record high total of 1,013 swans on 250 waterbodies (Table 2, Figure 1). Aerial survey coverage was largely the same as in previous surveys, with the addition of small areas with suitable water bodies southeast towards Fox Creek and north between the Smoky and Peace Rivers. Incidental observations by ground crews were also included in the total count. A number of paired swans were observed southeast of Grande Prairie on waterbodies not previously occupied near the junction of the Wapiti and Smoky Rivers. Flocks of swans were observed on local staging lakes such Bear Lake (113), Cutbank (34) and La Glace (42). These numbers may represent a cohort of nonbreeders or swans which abandoned sites in the Saddle Hills due to adverse environmental conditions affecting hatch and brood survival. However, it was observed that paired swans still occupied most lakes in the Saddle Hills.

Cygnets and brood numbers were up significantly from previous continental census in 1995 and 2000 (Norton and Beyersbergen 2000), however, cygnet numbers in the Saddle Hills were lower than in other parts of the survey area. The slight increase in survey area coverage in 2005 accounted for 35 swans, and, if removed from the total (1,013 swans), then similar survey area coverage and effort in all years allows for population size to be compared reliably between 1995, 2000, and 2005. Total adult numbers increased from 392 (1995) to 404 (2000) to 680 (2005), representing a 5.7 percent per year average growth rate over 10 years (Table 4), but the greatest recruitment occurred since the last survey.

Peace River - High Level

Surveys were conducted over a very large tract of the northwestern Alberta landscape and accounted for 420 swans on 112 waterbodies (Table 2, Figure 1). Survey effort and coverage was focused on known lakes with minimal exploration of new areas and was similar to the 2000 census with flights right up to the Bistcho Lake and Spawn Lake area on the Northwest Territories border. Surveys for Trumpeter Swans in the Hay-Zama wetland complex were completed during regular scheduled waterfowl surveys carried out by the Alberta Conservation Association. Numbers of cygnets and adults represented a 129 percent and 84.5 percent increase over those observed in the 2000 survey. Total adult numbers

(Table 4) increased from 132 (1995) to 148 (2000) to 273 (2005), an average annual growth rate of 7.5 percent per year, but the greatest increase occurred since the last survey. Observation of numerous unoccupied wetlands with suitable habitat indicates potential for continued expansion and concentration in this area.

High Prairie – Utikuma – Peerless

The 2nd year of survey coverage for this new region was similar to that in 2000 and covered an area around High Prairie, north of Utikuma Lake, west of Peerless Lake, and south of Spawn Lake. A survey flight was undertaken to cover habitat southeast to Athabasca. A total of 159 swans was found in the area, at 46 locations. Adult numbers increased by an average annual rate of 21.3 percent per year over 5 years (Table 4) with cygnet numbers slightly less than double and total swans more than double the number observed in the 2000 survey.

Edson – Whitecourt – Drayton Valley

More than double the swans were located this year in comparison to the 32 found in 2000 (Figure 1, Table 2). This year's search area included sites of incidental observations during the 2000 survey and expanded to include wetland sites with unconfirmed reports of swans in later years. The expansion area accounted for five adults while the traditional search area had 42 adults and 21 cygnets. Cygnet production was seven times higher this year than the three cygnets found in two broods in 2000 for this area. In the traditional survey area, the adult population increased by an average annual rate of 7.7 percent per year over the 5 years (Table 4).

Lac La Biche – Cold Lake

A survey area similar to the 2000 census was covered for lakes and waterbodies around St. Paul, east of Athabasca, Lac La Biche, and north to Fort McMurray (Figure 1). In addition, access to the Cold Lake Air Weapons Range, east of Lac La Biche, was granted allowing extensive surveys of the site. The lakes in the Department of National Defense (DND) range did not appear to be very suitable for swans as most are pure muskeg lakes with very little emergent vegetation and limited riparian habitat. No swans were observed in the DND area. Four adult swans were seen at three locations, but no young were observed (Table 2). A pair was present at Elinor Lake and two singles in the vicinity of Lac La Biche. This represents less than half the nine adults observed in 2000.

Elk Island National Park

Thirty five swans were counted in the Elk Island National Park area (Table 2, Figure 1) in an area similar to that of the last two continental surveys (1995 and 2000). Twenty five adult swans (10 pairs and 5 singles) were resident in the survey area during summer 2005. Three pairs successfully fledged broods of five, two, and three cygnets in this reintroduced population which continues to grow each year. Total number of adults observed in 2005 represents an average annual increase of 9.0 percent per year over the past 10 years (Table 4). Trumpeter Swans continue to expand to suitable habitat outside the Park and now occupy territories up to 25 km from the Park.

Pincher Creek – Waterton Lakes National Park

Twenty eight swans including two broods (total 8 cygnets) were recorded in the Pincher Creek - Waterton Lakes National Park area on 14 waterbodies (Table 2, Figure 1). The adult numbers showed an average annual reduction of 3.2 percent per year from the 27 adults recorded in 2000. The number of broods was half this year while total cygnet numbers only dropped by two individuals. An isolated, group of three adults spent the summer of 2005 at Frank Lake, east of High River compared to the nonbreeding pair observed on Frank Lake during the 2000 surveys.

Northwest Territories

Nahanni National Park - Deh Cho Region

Surveys of the park and the Deh Cho Region, formally referred to as the Southwest Mackenzie District, resulted in a total of 415 birds found (Table 2, Figure 1), including 37 broods (88 cygnets). Survey effort outside Nahanni National Park was comparable to the 2000 survey and more birds were found in 2005 (400) than in 2000 (294). The total number of adults observed in 2005 was higher than that observed in 2000 by 123 birds which represent an average annual increase of 9.0 percent per year over the 5 years. Cygnet numbers were slightly lower by two individuals while the number of broods observed was higher in 2005; adults and young were distributed over the survey area while the Tetcela River valley showed the highest concentrations. The upper reaches of the South Nahanni River, surveyed by Parks Canada staff, was covered this year despite poor weather conditions and accounted for a total of 15 adults, but no young were observed.

Saskatchewan

Hudson Bay

The Porcupine Forest southwest of Hudson Bay, the Porcupine Hills of Saskatchewan, the southern area of the Pasquia Hills, and a lone wetland in the Cumberland Delta (Kim Eskowich, Ducks Unlimited Canada, pers. comm.) accounted for 78 swans, including 25 cygnets (Table 2, Figure 1). Adults numbers showed an average annual increase of 9.3 percent per year over the 10 years with the total observed at 51 (2005) compared to the 21 seen in 1995 and 2000 (Table 4). The number of broods increased eight times compared to those observed in 1995 while cygnet numbers only increased five times during the same period.

The majority of the Pasquia Hills wetlands checked appeared to be comprised of habitat which had lower potential for swan use compared to the Porcupine Forest and Porcupine Hills. Most of these muskeg lakes had very little emergent vegetation and limited riparian habitat. Swans observations were limited to the southern sections of the Pasquia Hills with habitat similar to the Porcupine Forest and Hills. Abundant suitable wetland habitat was unoccupied in the Porcupine Forest and Porcupine Hills survey area. The Cumberland Delta marshes north of the Pasquia Hills, which were checked during waterfowl surveys conducted by Ducks Unlimited Canada, has numerous wetlands potentially suitable for swan use.

Prince Albert – Candle Lake

No swans were observed during flights over the area on lakes where swans had been observed in the 2000 survey year. No swan survey was scheduled for the area, but regular surveillance of the lakes during aerial fire patrols in the region did not result in any swan observations.

Cypress Hills Provincial Park

No swans were observed in 2005 which was similar to the 2000 survey year. Park staff and visitors have not reported any Trumpeter Swans for quite a few years in the area. A lone adult was observed during the 1995 continental survey.

Manitoba

Duck Mountains – Porcupine Hills

The Duck Mountains are comprised of two parts: the provincial forest and the provincial park. The first

confirmed observation and breeding of Trumpeter Swans in this area was in June 2002 by Ducks Unlimited Canada personnel while conducting aerial surveys for waterfowl. In 2005, extensive aerial surveys of the numerous wetlands were conducted in late summer. Swans were observed on three sites and included two pairs and a single swan. No young were observed in 2005.

Riding Mountain National Park

The first confirmed observation and breeding of Trumpeter Swans in the Park was in September 2002 by Park's staff conducting fire patrols in the Park. Annual monitoring of the swans in the Park has occurred since 2002. The total numbers of adults have remained fairly stable, although fluctuation in the number of cygnets has been observed (Wybo Vanderschuit, pers. comm.). The 20 adults and 10 cygnets observed in 2005 represents the highest total count and are similar to the numbers observed in 2003.

Whiteshell Provincial Park

In the Spring 2005, additional unconfirmed reports of Trumpeter Swans were received from the Pinawa area on the west edge of Whiteshell Provincial Park. An extensive survey flight of all the lakes and wetland complexes was conducted in late August. Trumpeter Swans are documented just across the Manitoba and Ontario border in the Kenora area, but no swans were detected during the flight in the area of Whiteshell Provincial Park.

DISCUSSION

Trumpeter Swans are doing extremely well across the region with large increases in most survey areas in 2005 compared to the 2000 survey. The exceptions are the Lac La Biche and Pincher Creek – Waterton areas which registered declines in total swan numbers. Alberta has the largest number of swans and they are dispersed across seven geographic areas or regions (birds in an area are sometimes referred to as a “flock”). Alberta's regional or flock population sizes ranged from 4 to 1,013 Trumpeter Swans for the Lac La Biche and Grande Prairie areas respectively. The Deh Cho Region, formerly the Southwest Mackenzie District, had poor cygnet production this year and observed cygnet numbers represented only 21 percent of total swans observed and the mean brood size (2.37) was the lowest for the region.

As Trumpeter Swans continue to expand across the region, it will become increasingly more difficult to make comparisons between survey years if survey effort changes to compensate for the expanded areas. This was the case for the 2000 survey and, although survey effort was expanded slightly in a number of areas in 2005, there was a minimal increase in the number of swans recorded in these expanded areas. It appeared that the density of swans and occupancy rate of survey lakes increased in a number of regions resulting in the large increases in swan numbers. It is not known why more paired and breeding adults were not observed in 2005 in the Lac La Biche area which appears to have numerous suitable wetlands. It is expected that breeding adults from the core breeding flocks in the High Prairie-Utikuma-Peerless and Peace River areas will expand into the Lac La Biche areas, although it may take several more years for this expansion to occur. However, across the survey region, overall increases in the Trumpeter Swan population were observed in Alberta (74%), Saskatchewan (100%) and the Northwest Territories (56%) while Manitoba is in its 1st survey year in 2005.

A number of survey crews noted the presence of large numbers of unoccupied, but apparently suitable, wetlands for Trumpeter Swans indicating the potential for increased swans in their areas, in future years. The Trumpeter Swans surveyed in this region are components of two distinct continental populations. Those birds which breed and summer in Alberta and the Northwest Territories are part of the Rocky Mountain Population which winter primarily in the Greater Yellowstone area. The swans in eastern Saskatchewan and Manitoba are considered part of the Interior Population and are known to winter in the region of the Lacreek National Wildlife Refuge, South Dakota. Both of these wintering areas have limited capacity for supporting increased numbers of Trumpeter Swans. Thus, restriction on expansion of the wintering areas will more likely limit overall population growth than will the availability of summer habitat for Trumpeter Swans in this region.

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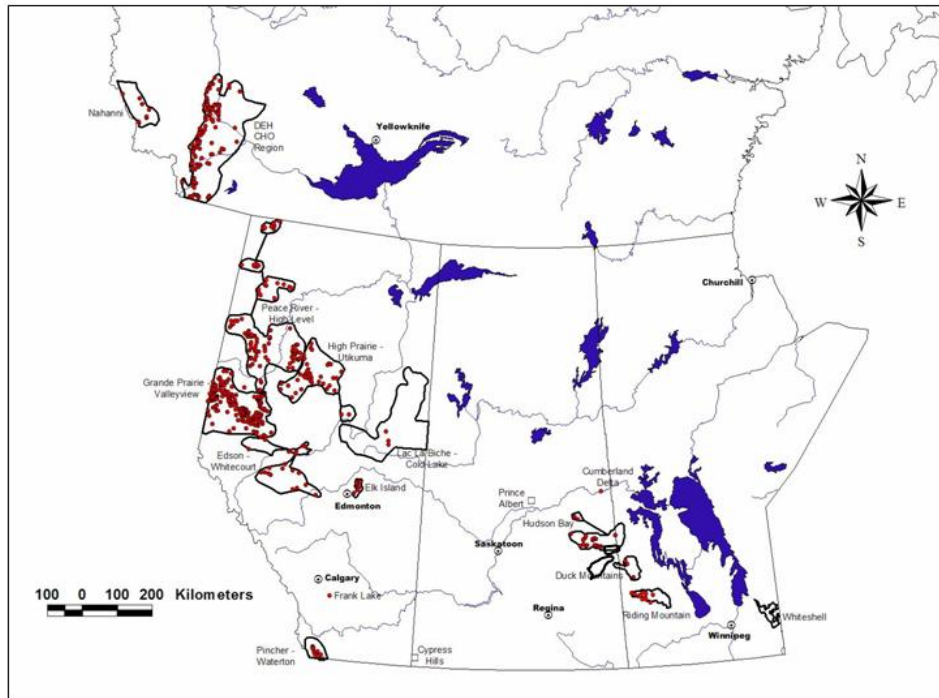


Figure 1. Survey coverage and Trumpeter Swan distribution in the 2005 survey in Alberta, Saskatchewan, Manitoba and the Northwest Territories.

Table 1. Survey dates, methods, and effort of 2005 Trumpeter Swan surveys in Alberta, Saskatchewan, Manitoba, and the Northwest Territories.

Jurisdiction	Geographic region – survey area	Dates	Survey Method	Effort (hours)
Alberta	Grande Prairie - Valleyview	24 & 25 August, 1 September	Fixed-wing	17.0 Hours
	Peace River – High Level - Hay Zama	29, 30 & 31 August 30 August	Fixed-wing Helicopter	23.9 Hours 3.5 Hours
	High Prairie - Utikuma – Peerless	25 & 26 August	Fixed-wing	14.9 Hours
	Edson – Whitecourt – Drayton Valley	24 & 25 August	Fixed-wing	9.1 Hours
	Elk Island National Park – Blackfoot - Ministik	14 September	Fixed-wing	2.5 Hours
	Lac La Biche – Cold Lake – Athabasca	3, 6 & 7 September	Fixed-wing	20.0 Hours
	Pincher Creek – Waterton National Park	25 August	Helicopter	3.0 Hours
	Saskatchewan	Hudson Bay – Porcupine Hills – Pasquia Hills	21 August	Fixed-wing
Manitoba	Duck Mountains – Porcupine Hills	19 August	Fixed-wing	4.3 Hours
	Riding Mountain National Park	29 & 30 August	Fixed-wing	6.2 Hours
	Whiteshell Provincial Park	30 August	Fixed-wing	3.0 Hours
Northwest Territories	Fort Liard –Tetcela R.	24 – 27 August	Fixed-wing	18.3 Hours
	Nahanni National Park	8 September	Fixed-wing	2.5 Hours

Table 2. Trumpeter Swan observations recorded for Alberta, Saskatchewan, Manitoba and the Northwest Territories in 2005. Figures are a combination of formal surveys and incidental sightings.

Jurisdiction Geographic region	Total Swans	Adults	Cygnet	% Cygnet	Number of broods	Brood Size	
						Mean	S.E.
ALBERTA							
Grande Prairie - Valleyview	1013	703	310	30.6	96	3.23	0.15
Peace River – High Level	420	273	147	35.0	41	3.59	0.19
High Prairie - Utikuma – Peerless	159	97	62	39.0	17	3.65	0.44
Edson – Whitecourt – Drayton Valley	68	47	21	30.9	7	3.00	0.82
Elk Island National Park (N.P.)	35	25	10	28.6	3	3.33	0.88
Lac La Biche – Cold Lake	4	4	0	0	0	0	0
Pincher Creek – Waterton N.P.	31	23	8	25.8	2	4.00	1.00
TOTAL	1730	1172	558	32.2	166	3.36	0.12
NORTHWEST TERRITORIES							
Fort Liard – Nahanni N.P. - Tetcela	415	327	88	21.2	37	2.37	0.21
TOTAL	415	327	88	21.2	37	2.37	0.21
SASKATCHEWAN							
Hudson Bay	78	53	25	32.1	9	2.78	0.40
TOTAL	78	53	25	32.1	9	2.78	0.40
MANITOBA							
Duck Mountains – Porcupine Hills	5	5	0	0	0	0	0
Riding Mountain N.P.	30	20	10	33.3	3	3.33	0.88
TOTAL	35	25	10	28.6	3	3.33	0.88
SURVEY TOTALS	2258	1577	681	30.1	215	3.17	0.10

Table 3. Total number of adult and subadult Trumpeter Swans in Alberta, Saskatchewan, Manitoba and the Northwest Territories observed as singles, paired, or in flocks in fall 2005.

Jurisdiction	Sub region	Singles		Paired		Flocked		Total	
		No.	%	No.	%	No.	%		
Alberta	Grande Prairie - Valleyview	22	3.1	414	58.8	267	37.9	703	
	Peace River – High Level	11	4.0	194	71.1	68	24.9	273	
	High Prairie - Utikuma – Peerless	7	7.2	66	68.1	24	24.7	97	
	Edson – Whitecourt – Drayton Valley	3	6.4	32	68.1	12	25.5	47	
	Elk Island National Park (N.P)	5	15.4	20	84.6	0	0	25	
	Lac La Biche – Cold Lake	2	50.0	2	50.0	0	0	4	
	Pincher Creek – Waterton N.P.	4	17.4	16	69.6	3	13.0	23	
	Northwest Territories	Fort Liard – Nahanni N.P. - Tetcela	22	6.7	232	70.9	73	22.3	327
	Saskatchewan	Hudson Bay	2	3.8	38	71.7	13	24.5	53
Manitoba	Duck Mountains – Porcupine Hills	1	20.0	4	80.0	0	0	5	
	Riding Mountain N.P.	4	20.0	16	80.0	0	0	20	
Survey Totals		82	5.2	1036	65.5	460	29.2	1578	

Table 4. Comparison of Trumpeter Swan survey results for Alberta, the Northwest Territories, and Saskatchewan. Only similar survey areas are covered in this comparison, therefore total numbers reported here will differ from previous tables. Adjustments were made to the appropriate swan numbers to exclude expansion areas from sub-region figures. Comparisons were only available with the last 5-year survey for several locations.

Jurisdiction	Sub-region	Year	No. Adults	No. Broods	No. Cygnets (mean)	Total Swans
Alberta	Grande Prairie - Valleyview	1995	392	41	141 (3.43)	533
		2000	404	60	204 (3.40)	608
		2005	680	95	306 (3.22)	986
	Peace River - High Level	1995	132	25	67 (2.68)	199
		2000	148	21	64 (3.05)	212
		2005	273	41	147 (3.59)	420
	Elk Island National Park	1995	11	0	0	11
		2000	8	2	5 (2.5)	13
		2005	25	3	10 (3.33)	35
	High Prairie - Utikuma - Peerless	2000	37	7	35 (4.5)	72
		2005	97	17	62 (3.65)	159
	Edson – Whitecourt – Drayton Valley	2000	29	2	3(1.50)	32
		2005	42	7	21(3.0)	63
	Pincher Creek – Waterton National Park.	2000	27	4	10 (3.33)	37
		2005	23	2	8 (4.0)	31
Northwest Territories	Fort Liard - Tetcela	1995	132	15	47 (3.1)	179
		2000	180	28	77 (2.75)	257
		2005	312	37	88 (2.37)	400
Saskatchewan	Hudson Bay	1995	21	1	5 (5.0)	26
		2000	21	4	17 (4.25)	38
		2005	51	9	25 (2.78)	76